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An Address
ON
THE ABDOMINAL EMERGENCY*

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During the years it has been my privilege to practise surgery, I have witnessed the usual number of tragedies; and by these I mean lives which could have been saved by an early diagnosis, and prompt action. They have been largely acute conditions of the abdomen. This is the secret chamber where many pathological plots are hatched, and it is the aim of the abdominal surgeon to ferret them out before they ripen into action; before their mines are sprung and disaster is widespread. There is no other field in the whole range of our work where so much may be done to save a life; but recognition of the gravity of the case must be early, and surgical action, sane and effective. I am addressing myself mostly to the general practitioner, and am dealing with the abdomen as a unit. There is no attempt to go into the minute etiological and pathological factors of each organ, but rather an effort to present a rough sketch of the whole clinical structure, using only those lines which have served best to keep ever before one the important strategic points in interpreting and managing the problem of the acute abdomen.

Far be it from me to cast any slight upon the more modern methods of diagnosis; upon anything that may help to lead us to the truth. But I am bound to say that as far as diagnosis of the acute abdomen is concerned, we have yet no machine or laboratory formula, which can take the place of observation and experience. I sometimes think our modern graduate tends too much to "short cut" methods of making diagnoses, and I think it would be good for us all to read occasionally the works of the old clinicians. It will take some of the pride out of us, at least. Striking, indeed, to the modern student are the observations they made, and the principles they induced from these observations. It is a proud boast, as Sir Berkeley Moynihan has said, that the principle of induction to which science owes so much, was evolved, and found its first application in medicine. Deduction, in logical sequence, rounded out the edifice to which we have added much, but whose foundations we have not had cause to touch.

The problem of the acute abdomen is largely the problem of early diagnosis, and the general practitioner who is the point of contact of our whole professional phalanx, bears the weight of the responsibility. He has to make up his mind definitely, and set action on the heels of decision. He has to transform a household, thick with misgivings and apprehensions for all operative measures, to one of confidence and hope Most patients to-day, and their relations, have enough of the Missouri element to want to be told, and many who would otherwise refuse, will consent to an operation when the doctor, after clearly explaining the nature and dangers of the case, places the responsibility upon themselves. Human nature in illness is still a clinging vine; although perhaps, it looks more than formerly to the stability of the object to which it clings.

There are two sources of information in the case. (1) *The Patient's clinical history.* (2) *The*

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interpretation and study of the symptoms. Whoever has developed the art of getting a good clinical history is well on the way to efficiency in diagnosis. Has this patient ever had an acute abdominal experience before? Has there been any chronic condition? If none, then the present attack has come upon abdominal organs normal up to now, and the symptoms should not be obscured by intra-peritoneal adhesions or other changes due to previous attacks. In other words, the clinical manifestations of a first attack of acute appendicitis, gall bladder, perforation, etc., are more likely to be nearer what the books call the "classical symptoms" than a subsequent attack. Nature may cure an inflamed appendix by surrounding it with a lava of lymph and wrapping it about with adhesions. The host is saved for the time, but the appendix itself may be permanently tied down to some other organ or structure, so that when the next attack comes some of the symptoms, at least, may be much changed. I have seen cases of appendicitis where frequent micturition and deep seated pain in the loin were early symptoms. The question of differential diagnosis with a renal ureteral condition had, of course, to be considered. I have observed that such cases of appendicitis frequently give a history of a first attack in which the renal ureteral symptoms were absent.

The explanation lies, of course, in the position the appendix has been made to assume by adhesions. Symptoms of acute gall bladder may be simulated the same way when a long retrocolic appendix reaches up near the liver. Not long since, I saw an appendix so placed, with the tip buried and abscessed. The symptoms and clinical picture resembled rather those of an acute cholecystitis. The history of a previous attack will often help materially, through the symptomatic clarity incidental to first attacks, to throw light upon the picture.

I have a rough and ready way of dividing the area of search when the problem of acute abdominal pathology has to be met. First, is it above or below the diaphragm? Second, if below, is it within or without the peritoneum? 'Tis evident such a classification is broadly clinical, and adopted for convenience. In children particularly one may have great difficulty in deciding between an acute appendicitis and a right sided pleurisy, or pleuro-pneumonia involving the diaphragmatic pleura. Not infrequently a child comes to my service in the Victoria General Hospital with a diagnosis of acute appendicitis, in whom the real trouble is pleuro-pneumonic. Our judgment is best founded on the abdominal examination. An appendicitis may co-exist with a pleurisy, pneumonia, or a bronchitis. It is a clinical fact that a pneumococcus infection of the lung and pleura may be a close first cousin of a similar one in the peritoneum. Hence, examine the abdomen thoroughly. Muscular rigidity and tenderness may be present in both, but if the infection is above the diaphragm, the muscular rigidity is entirely reflex through thoracic nerves and careful palpation should reveal it. It can not be done in a hurry. Sitting by the bedside gently palpating the abdomen for fifteen or twenty minutes often reveals the character of the abdominal muscle hardness. The right rectus has a secret to tell, and with care and tact you may coax it away. It is the staunch and faithful protector of the delicate and highly sensitive peritoneum, and if this organ is not being attacked, it is likely to relax the vigil it has temporarily taken on out of sympathy for a remote organ and thus give the secret away. The rectal examination, never to be ignored, is particularly useful in such cases. In a child, in determining the presence or absence of an inflamed appendix, the examining index finger can readily reach over to the right iliac region. A mass can be detected and tenderness noted. As between an acute appendicitis and a right sided pleuro-pneumonia, the rectal examination often clears the issue at once. Of course, the presence of cough, high temperature, rapid respirations and high leucocytosis all point to a pulmonary source. They are not conclusive, however, and it is a good rule to assume that the lesion is abdominal until the negative is proven by a close diagnostic search. This brings the crux of your judgment on the abdominal examination, which is the point I emphasize.

At the risk of staging your undergraduate days in clinical surgery, I shall say a word about palpation. In acute abdominal conditions I have not found much help in what are called superficial reflexes. That perhaps is my fault. But I do feel that one can study every mood of the abdominal musculature by careful, patient, prolonged palpation. With the patient's confidence won, tender areas are defined, and what

is more important, the localization and degree of muscle hardness. Pain and tenderness are in a large degree subjective, and their interpretation may suffer from what we have all many times observed; namely, the individual's tolerance or susceptibility to pain. The nerve mechanism which throws a portion or the whole of the belly wall on guard is automatic and definite; and may give us evidence of an intra-peritoneal pathological condition when pain or tenderness is absent. Study, therefore, the temper and the moods of the abdominal wall with the palm of the hand moving slowly and lingeringly over the whole field. The maximum area of rigidity, and pain if present, with lines of decreasing resistance extending out from it, leaves a conviction which nothing else does that you are near the enemy's camp.

Two years ago I saw a middle aged man three hours after a perforation of the pylorus. His knees were drawn up, abdomen scaphoid and rigid as a board. He said he had a sharp pain when the attack began, but was now feeling comfortable. He had had no morphia. A history of fifteen years of indigestion and the clinical picture he presented, made a diagnosis of perforation inevitable. His comparative relief from pain made it difficult for me to convince himself and his household that immediate operation was necessary. He refused to go to the hospital in an ambulance; and, when I saw him walk down unaided and step into his son's car, I had an uneasy sense of being on the wrong track. The operation, an hour after, disclosed a perforation in the pylorus which was leaking fast. Already there were puddles of stomach contents in the peritoneal fossæ, and a large one in the bottom of the pelvis. The upper peritoneum had that angry, irritated look, which one remembers so well, and is the usual phenomenon when an irritating chemical substance breaks its bounds and runs amuck in the unguarded peritoneal cavity. This case is taken from a number of acute perforations, because it supports the observation that, while severe pain is the rule, it is not so reliable as muscular rigidity, and the patient's clinical history.

With all that has been spoken and written on the subject, I think the appendix still claims the greatest number of fatalities. It is by far the most frequent acute abdominal ailment. It is, too, the most curable of them all. Until something better comes, the inflamed appendix should be removed at once. To let it go on waiting for resolution is, to say the least, a precarious business. There is a dictum to the effect that, given an acute abdomen, and the clinical evidence is not diagnostic of any condition in particular, you are safe in calling it appendicitis. There are many reasons why the symptoms of appendicitis may be erratic. Some have already been mentioned. Never lose sight of the fact that it is not a real organ, but an intestinal tail which may vary much in length; may hang down into the pelvis; may reach across the middle line of the abdomen; may curl up under the cæcum; may attach itself to the omentum and be pulled about with the ebb and flow of intra-abdominal pressure; may bury its tip in the retro-peritoneal tissue, and, becoming inflamed, set up a most severe cellulitis in this region. Its inherent powers for mischief are very great; and it seems to me there is no end to the pathological vagaries of an inflamed appendix. The surgeon alone knows the real pathology of the appendix, because he sees it in action. He sees it in its favorite rôle of infecting other organs. He sees it in its relation to its neighbours, which is as good an observation in pathology as it is in sociology.

Between the ages of two and seventy a history of acute abdominal pain, vomiting (or nausea without vomiting), slight rise of temperature and pulse, constipation, tenderness and some muscle hardness in right iliac region, this latter becoming more definite as the hours pass, means appendicitis. The evidence is positive, and your diagnosis as certain as one has any right to be of any diagnosis. The doctor sees the case and points out the possibilities,—resolution, perforation into the unguarded peritoneum or into a well walled off area, abscess formation with local or general peritonitis, gangrene, etc. As the case is typical, he feels there are thirty-six hours or so of comparative safety during which an operation may be performed. This is generally true; but there are exceptions, and the exceptions are likely to go in the tragedy list. If the beginning of the pathological process in the appendix always corresponded in time with the appearance of the symptoms, our responsibility would be greatly relieved. We know the appendix may ulcerate into the peritoneum without any symptoms up

to that point which arouse the patient's fears. Hence, the very first symptoms the doctor may find, perhaps an hour after the pseudo-beginning of the attack, may lead him into the the error of diagnosing acute appendicitis, with the usual twenty-four hours or so of safety in which to operate. Here is a case in point. A college professor, subject to attacks of what he called indigestion, felt a slight abdominal discomfort during the afternoon while about his work. He thought it was one of his usual attacks coming on, and took the precaution to ease up on his evening meal. An hour later he was seized with severe abdominal pain, vomiting, tenderness in right iliac region, slight temperature and pulse disturbance. He was seen by a physician who diagnosed acute appendicitis, and feeling there were still some hours of safety, gave him morphine and decided to await developments of the night. The morning picture showed a very hard, dull lower abdomen and a very sick man. He was operated on at once. A perforated appendix and the lower abdomen filled with pus, was the condition found. While something must be left to the physician's judgment, for he alone is in intimate touch with the individual case, and in possession of what evidence there is to determine a margin of safety, yet there are real dangers in delay; practically none in prompt action. Be sure you are at the beginning of the attack before you put your marks down, and then, when quite satisfied on the point, remember that, with the appendix, *things are not always what they seem.*

The differential diagnosis of acute appendicitis from acute pelvic conditions may present difficulties. Frequently operative urgency is common to both, so that in such cases the patient's interests are safe whichever the diagnosis be. More than once I have operated for acute appendicitis and found a right sided ovarian cyst (goose-egg size) twisted on its pedicle, free fluid in the peritoneal cavity and all other signs of a right sided peritonitis. The error in diagnosis is more likely to be made where the strangulation of the ovarian pedicle is not complete. Where the strangulation is complete, the symptoms are more violently abrupt and localize themselves earlier than in acute appendicitis. Two years ago, I operated on a young student with very definite symptoms of appendicitis; abdominal pain, vomiting, a rise in temperature and pulse. The oncoming of the attack was not just altogether typical, but definite enough. He said it began the day before, after a game of football in which he was kicked in the abdomen. Operation showed an orchitis, probably traumatic, in an undescended intra-abdominal testicle. Had I examined the scrotum, as one should always do where right sided pain is the issue, I should probably have been able, from the history, to arrive at adiagnosis. Remember the appendix, with all its pathological resource, has not a monopoly of right sided pain and tenderness. When a patient tells me the pain began in the right side, and has either remained there or has extended over the abdomen, and I find on careful questioning that there was no initial pain about the midddle of the abdomen; in other words, that the pain did not start about the umbilicus and "spread" to the side, I assume that this is not appendicitis until I have proven it is nothing else. The pain of a pregnant tube, congested ovary, salpingitis, stone in right ureter, or right pyelitis, is usually localized from the beginning of the attack.

When a pregnant tube ruptures, and there is a large hæmorrhage, the diagnosis should be easy. A right sided ectopic is, however, to be differentiated occasionally from an acute appendicitis. There is often a slight rise of temperature and pulse and a leucocytosis as high as 15,000. Pregnancy of the uterus or tube is essentially concerned with the genital tract, and you will generally find some sign or symptom associated with the function of this tract. A missed period is of value only in a patient whose previous menstruation has been regular, and uterine discharge is not a constant symptom of a pregnant tube. This should be remembered before ruling out tubal pregnancy. Free blood in the peritoneal cavity does not throw the abdominal muscle into the same degree of rigidity as obtains in peritonitis or perforation of the stomach or intestine.

For the patient's interest (which is the only one) no great harm comes when, under exceptional symptomology, one is unable to decide the exact nature of the acute condition. Each one beckons the surgeon into the abdomen, and while we aim at efficiency in exact diagnosis, we must not stand by to await further evidence when action is the urgent call. I have occasionally had great difficulty in differentiating

between a tubal and a uterine pregnancy. Given a uterine pregnancy with some pre-existing damage to a fallopian tube, and an abortion threatening, and you will have a clinical picture which is hard to interpret. Considerable pain may be present to the right or left of the uterus. Inability to decide between the two is a reasonable indication to " wait and see". If uterine, the evidence will soon be conclusive and the danger of waiting and watching for a few days is not particularly great in an early ectopic.

Intestinal obstruction is a common enough cause of the acute abdomen. Early observation is imperative. There may be local evidence of the condition, as where a loop of bowel or bit of omentum is caught in a hernial opening. Indeed no examination of an acute abdomen is complete without thorough examination of the hernial sites. The absence of a lump in or about the inguinal and femoral canals is no guarantee that a strangulated hernia does not exist. The finger should be worked well up through the external ring. It is not easy to do this in the case of the femoral ring; but, if a small knuckle of bowel or omentum is caught here, you will detect local tenderness. The presence of abdominal scars suggests either a strangulation in a badly healed wound, or from adhesions within the peritoneum. Remember that even the most perfect operator leaves behind him, when he finishes his operation, enough trauma of the peritoneum to produce a crop of adhesions. And there is a most striking difference in individual capacity for forming adhesions. In some patients they are absorbed readily, after serving, doubtless, a useful purpose. In others, they persist indefinitely, forming sometimes pockets or nests into which coils of intestines may become herniated and strangulated. I need hardly say, of course, that adhesions may also exist where there has been no previous operation. Other causes of internal strangulation may be due to rents in the mesentery and hernation into the foramen of Winslow, volvulus, etc.

Another rôle of adhesions in the abdomen is to mix up pretty badly our text-books' description of gastric and duodenal perforations. As an ulcer reaches to or near the peritoneal coat, adhesions may form about the area. The omentum, with almost conscious precision, may take a big part in the barrier; and by and by, when the ulcer breaks the peritoneal coat, and stomach contents begin to sieve through, the classical symptoms of acute perforation may not be present. Instead there is evidence of localization. Later pyogenic organisms enter the area and a real localized abscess results. I saw one such case a few years ago which had been diagnosed as an appendical abscess. The leak had worked down through a block of adhesions from the duodenum, and in the manner indicated, went on to suppuration forming a swelling under the right rectus well down the abdomen. The operative technique here is important and difficult; for soiling of general peritoneum is hard to avoid. Carefully getting into the abscess cavity, cleaning out and packing with gauze is about as much as one has any right to attempt. A subsequent operation may be called for when the field is rendered surgically clean.

Acute intestinal obstruction has its vagaries, like most things in the abdomen. It seems strange that an annular carcinoma of the colon can go on and produce no symptoms until complete obstruction occurs. Unless there is twisting of the bowels at the site of growth, there is no strangulation at first, and hence there is no severe pain there. Gradual distension, nausea, obstinate constipation, and finally severe pain. At the cancer age, a patient with such symptoms probably has cancer of the colon. If he gives a history of loss of weight, indigestion, constipation, etc., the evidence is strong, but the absence of such history does not negative the probability of cancer.

Besides perforation of peptic ulcers the upper abdomen gives us the problems of acute or chronic gall bladder conditions, and acute or chronic pancreatitis. My impression is that few clinicians go wrong on acute disease of the gall bladder. The signs and symptoms are pretty definite, and the text-book descriptions are pretty well standardized and satisfactory. The chronic gall bladder, like the chronic appendix, opens up a vista of diagnostic speculations which I cannot touch here.

The presence of sudden violent epigastric pain, with shock, feeble pulse, sub-normal temperature, persistant vomiting, tenderness over epigastrium and, altogether, illness out of proportion to what you might expect from any other acute abdominal condition, probably means

acute pancreatitis. It seems a comparatively rare disease.

No phase of surgery calls for more resource than abdominal injuries. It is a time of trial in one's professional life. If ever there is an occasion when one suspects the shortcomings of design in not providing a peep hole commanding a view of the intra-peritoneal contents, it is just on such an occasion. The injuries naturally divide for clinical purposes into those (1) that perforate the abdominal wall, and (2) those that are not perforating. The former belong to wounds by bullets, knives or such like. How should we deal with such cases? If one sees the case immediately after the wound has been inflicted and there is no reason to doubt that the bullet, or knife, or whatever the instrument was, has passed through the peritoneum, then exploratory laporatory is the rational procedure. It is surely playing a frenzied game with the gods of chance to stand off, and hope that, in some way, the closed up ranks of abdominal viscera have broken and side stepped and ducked in order to let the invading weapon pass by. This rule should stand, regardless of the symptoms at this time, for unless there be a severe hæmorrhage the evidence of a severe visceral lesion during the first two hours or so, may be vague and uncertain. If the case is seen first, after from five to ten hours from the affliction of the wound, when there is time for symptoms to develop such as peritonitis, dullness in the flanks, muscle rigidity, tenderness, pulse and temperature, the question of operation should then, I think, be judged largely on the clinical picture with operation at hand if you can negative the wounding of a hollow viscus.

When there is no perforating wound of the abdominal wall, the call on your judgment is greater still. One should study carefully the exact nature of the blow, or crushing, or whatever the traumatic agent may have been. The liver and spleen are the ones most exposed to injury. Hæmorrhage and shock are the early outstanding symptoms; when there is crushing, as from a heavy wagon passing over the abdomen, these organs can hardly escape injury. The kidneys and bladder, too, may be contused or ruptured. Each of us will approach the problem in his own way, I suppose. Personally, I seek to eliminate, if I can, the renal tract from the field of investigation. Catheterization of the patient will show reasonably well the condition of the bladder. It reveals good evidence, too, of the condition of the kidneys, taken with careful palpation of the loins. In other respects the procedure is much the same as in the perforating wounds. If you are in doubt, and the condition of the patient will warrant the extra trauma of an operation, it is probably true that his best interests lie in that direction. The presence of dullness in the flanks, from hæmorrhage, is not in itself an indication for laporatory. Here again the time which has elapsed from the infliction of the injury is a big factor in determining the course you should pursue.

Three years ago a man was brought into the Victoria General Hospital suffering from profound shock, from which he died shortly after admission. He had sustained a blow on the abdomen from a piece of timber. The autopsy showed a piece of liver nearly as large as a fist completely broken off and lying loose in the peritoneal cavity. There were but slight signs of injury to the abdominal wall itself.

In conclusion, let me apply the Hippocratic aphorism to most acute abdominal disorders: "In acute diseases it is not quite safe to prognosticate either death or recovery."

Upper Respiratory Infection as Cause of Cholera Infantum.—Philip C. Jeans and Mark L. Floyd, Iowa City, direct attention to mastoiditis and nasal sinusitis as causes of "cholera infantum" and record further evidence, particularly in regard to sinus disease, that these infections are at least a common cause of the clinical picture. There is a relationship between upper respiratory infection and a clinical picture corresponding to what has been described under the term cholera infantum. In recent years all patients presenting this clinical picture who have come under the authors' observation have had either mastoiditis or paranasal sinusitis or both as the apparent underlying cause of their disturbance.—*J.A.M.A.*, July 24, 1926.